

REMARKS/ARGUMENTS

The amendments are supported by the specification:

- Claim 1: page 7, 1<sup>st</sup> paragraph;
- Claims 21-23: page 9, [0020]-[0021]; &
- Claim 24: page 22, " Evaluation of water resistance".

No new matter has been added.

The invention of the present claims relates to emulsion compositions. The inventors have found that emulsion compositions can be constructed so to have an increased sulfonic group content while maintaining sufficient water resistance. There is no disclosure or suggestion thereof in the cited reference. Reference will be made to the publication of the present application, US 2008/0224088 ("US '088"), rather than to the specification itself.

Rejection under 35 U.S.C. § 103(a)

The rejection of claim 1 under 35 U.S.C. § 103(a) in view of US 6,346,570 ("*Kazuyuki*") is respectfully traversed.

The Office alleges that *Kazuyuki* discloses emulsion compositions having components corresponds to components (A) – (D) of present claim 1 (see page 3 of the Office Action). The Office concedes that *Kazuyuki* does not disclose in the working examples emulsions having components corresponding to components (A) – (D) of present claim 1 (see pages 3-4 of the Office Action). However, the Office considers that the emulsions of the present claims would have been obvious based on the working examples and the disclosure of *Kazuyuki*. The present rejection is unsustainable.

At the outset, the Office's allegations are factually incorrect; *Kazuyuki* contains no disclosure of (*inter alia*) 1) hydrophobic solvents present in emulsions, and 2) polymers

soluble in hydrophobic organic solvents, *i.e.* component (D) of present claim 1. The Office refers to the disclosure at Col. 7:20-51 of *Kazuyuki*. However, there is no disclosure therein of hydrophobic solvents,<sup>1</sup> and *Kazuyuki* categorizes the additional resins as "other ***water-soluble*** resins". Col. 7:36, emphasis added. Thus, *Kazuyuki* contains no disclosure of components (B) & (D) of present claim 1. The Office must account for ***all*** limitations of a claim to sustain a rejection under 35 U.S.C. § 103(a). MPEP § 2143.03.

Related, non-inventive emulsions suffer poor water resistance when polymers having sulfonic groups are included in larger amounts (see "Background Art" of the present application). The present inventors have found that the emulsions can be formulated with components (A) – (D) of present claim 1 so that the content of sulfonic groups can be increased while maintaining sufficient water resistance of the emulsion composition:

[0005]The sulfonic group-containing polymers are hydrophilic (water-soluble) owing to their hydrophilic group; therefore, when the content of hydrophilic group is higher than a certain level, the polymers are very low in water resistance and, when they have been used, for example, as a membrane material, a binder material or a coating material, the polymers swell remarkably in the presence of water, inviting problems of significant reduction in the mechanical strength of membrane, easy peeling from base material and reduction in durability. For these reasons, the content of sulfonic group has been restricted and the properties of small resistance and hydrophilicity have not been exhibited sufficiently.

[0007]The object of the present invention is to provide an emulsion composition which has been increased in sulfonic group content, yet has sufficient water resistance and has been enhanced in properties such as small resistance, film-forming property, etc.

[0005] & [0007] of US '088. To achieve this aim, a water-based solvent (*e.g.* methanol - see claim 13) and a hydrophobic solvent (*e.g.* toluene - see claim 15) are used to dissolve a sulfonic group-containing polymer soluble in the water-based solvent and a polymer soluble in the hydrophobic solvent. The end result is that a content of the sulfonic groups in the

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<sup>1</sup> Production Example 1 discloses the use of hexane (Col. 14:4); however, this solvent is used in a purification process, not in making the emulsions.

emulsion compositions of 1 mmol/g or more can be achieved. See claims 21-22. In the dried form of the emulsion, *i.e.* claim 9, the amount is preferably from 0.2 to 4 mmol/g. See claim 23.

Applicants have demonstrated the superior water resistance for the presently claimed emulsion compositions, which can include the larger amounts of sulfonic groups (see claims 21-22). All of the emulsions of the inventive examples having a sulfonic group content of 3.4 mmol/g (see Tables 1 & 2 where component C1 was used, compound C1 discussed at [0080] of US '088) and exhibit a residual film ratio of at least 50% (see claim 24).<sup>2</sup> This ratio is measured by first weighing a dried film of the emulsion prior to immersion in water and comparing this weight against the weight of the same film upon immersion in hot water (95°C)—see claim 24. The comparative example exhibited a residual film ratio of less than 50%—see Tables 1 & 2 of the present application. Thus, the inventive compositions show minimal change in weight when exposed to water, unlike related, non-inventive compositions.

There is no suggestion or disclosure in *Kazuyuki* of emulsion compositions having hydrophobic solvents and polymers soluble therein. Thus, there is no disclosure of emulsions having an increased amount of sulfonic groups in sulfonic group-containing polymers while simultaneously being resistant to swelling when in the presence of water. Applicants have demonstrated, on the other hand, that inventive emulsions do exhibit superior water resistance while having a larger amount of sulfonic groups present therein. Thus the present claims are fully distinguished from the disclosure of this cited reference.

Accordingly, the rejection is no longer tenable & should be withdrawn.

#### Other matter

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<sup>2</sup> A ratio of 100% means that there is no change in the weight of the emulsion upon immersion.


The objection to the remaining claims is traversed for the same reasons given above.  
Accordingly, the objection is no longer tenable & should be withdrawn.

Conclusion

Applicants respectfully suggest that the present invention is in condition for allowance. Notification thereof is respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, L.L.P.

  
\_\_\_\_\_  
Benjamin A. Vastine, Ph.D.  
Registration No. 64,422

Customer Number  
**22850**

Tel: (703) 413-3000  
Fax: (703) 413 -2220  
(OSMMN 07/09)